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Alternative Fuel Vehicle Finance Initiative

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CENTER FOR CLIMATE
AND ENERGY SOLUTIONS

C2ES.ORG

About Center for Climate and Energy Solutions

- Independent, nonpartisan, nonprofit organization
- Working to advance strong policy and action to address the twin challenges of energy and climate change
- Founded in 1998 as the Pew Center on Global Climate Change
- Became C2ES in 2011

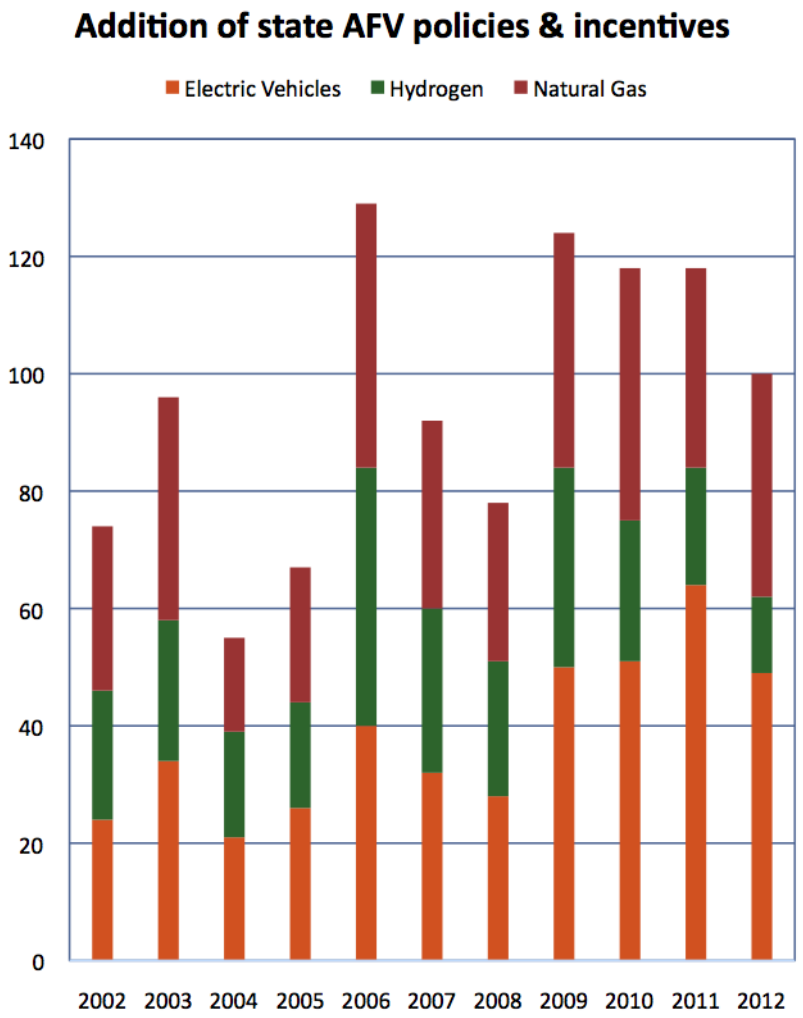
Business Environmental Leadership Council (BELC)

Presentation Overview

- AFV market state of play
- Project motivation
- Project scope and timeline
- AFV Advisory Group
- First paper: barriers
  - Market barriers that finance can help address
  - Barriers to private finance in deployment
  - Possible solutions

AFV Market State of Play

- **Lots of interest from policymakers (see chart at right)**
- **Natural gas vehicles**
  - Vehicle count is about same from 2003-2011, but fuel use up 68%
- **Electric vehicles**
  - More than 100,000 sold between 2011 and mid-2013
- **Fueling infrastructure**
  - 6,366 out of 6,663 electric charging stations were installed since 2010
  - 484 out of the 1313 public and private natural gas fueling sites have opened since 2010



Source: http://www.afdc.energy.gov/data/10360

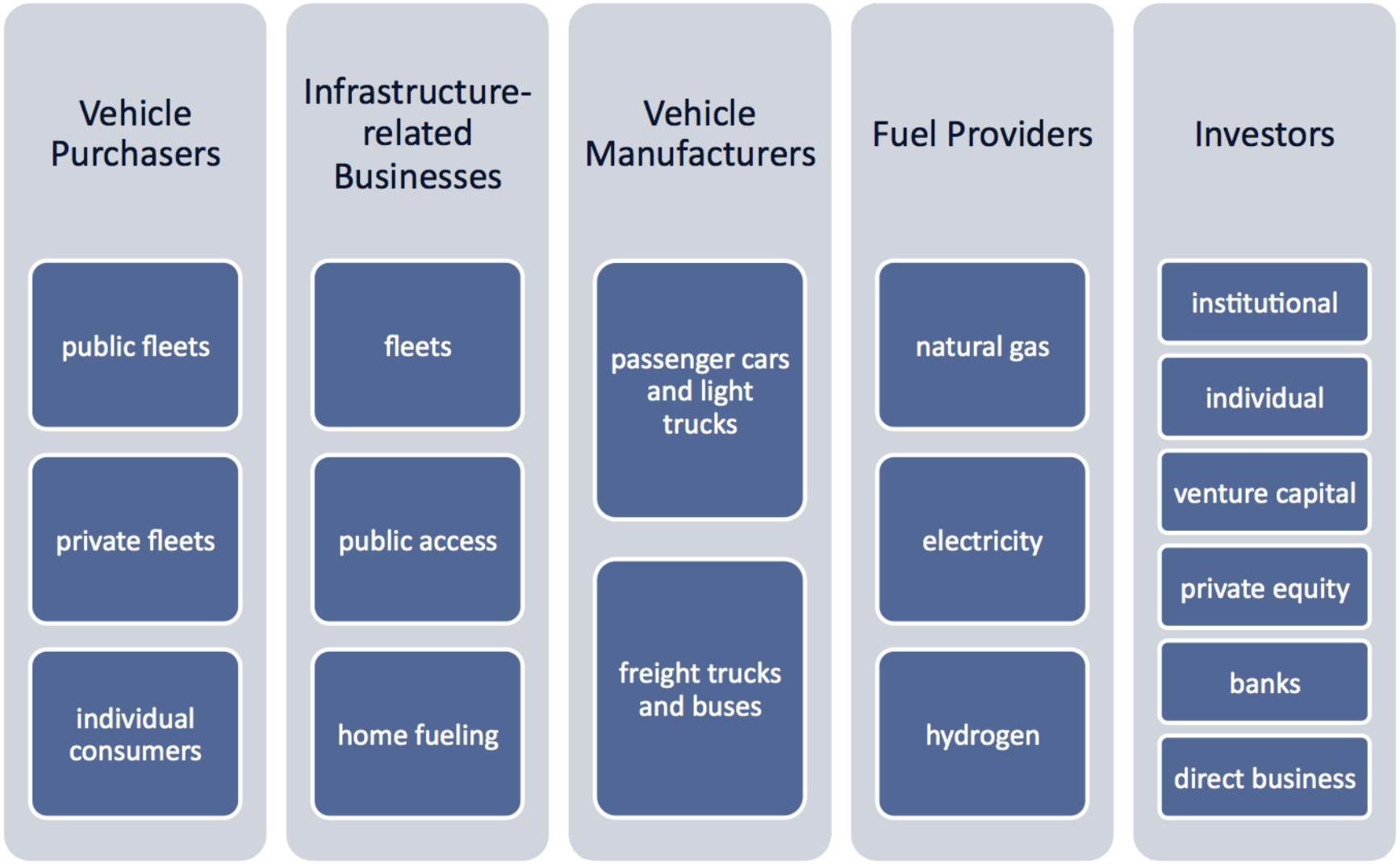
Project Motivation: Public Benefits

- **Public benefits of alternative fuels not captured in private market today**
  - Greenhouse gas reductions
  - Energy security
  - Local air quality
- **Lack of available public funds for deployment; need new private funding mechanisms**

Project Motivation: Finance Focus

- **Finance can correct market deficiencies and leverage public investments**
  - Monetize tax credits to expand eligibility
  - Consider total cost of ownership to lower upfront cost
- **Existing financial mechanisms have helped accelerate deployment of cleantech in other sectors**
  - Solar PV lease model
  - Energy savings performance contract for building energy efficiency technologies

Project Scope: Stakeholders and Fuel Types



Project Timeline

Identify Financial Barriers to Benefits

Energy efficiency improvements

Fuel savings

Cost Savings

Consumer undervaluing of operating cost savings

Environmental & energy security benefits

Prepare 2 Case Studies

Existing AFVs or fueling infrastructure project

Apply financing for energy efficiency savings from buildings to transportation

Develop Innovative Business Models

Fuel & vehicle value proposition

Target market

Cost structures & revenue streams

Implementation and/or demonstration guidance.

Test procedures

Create Strategic Plans for Implementation

Location or market-specific challenges & opportunities

Business model application to a particular market

Guidance including key players, policy actions, cost & benefit, & anticipated results.

AFV Advisory Group

- **National, regional, and local stakeholders advisory group**
- **Committee will provide direction and feedback on private investments in AFV and fueling infrastructure related to:**
  - Barriers
  - Possible solutions
  - Outreach activities
- **Committee will disseminate lessons learned, enhance findings, and implement recommendations (e.g., pilot new business models)**
- **Communication among committee members and project team will occur throughout project**
  - 2-3 in-person meetings
  - Monthly conference calls and/or webinars

AFV Advisory Group Members

- Black Coral Capital
- ChargePoint
- Coalition for Green Capital
- Colorado Energy Office
- DBL Investors
- American Gas Association
- EPRI
- Ernst and Young
- General Electric
- General Motors
- Johnson Controls
- NASEO
- NYSERDA
- NRG Energy
- Office of the Oklahoma Secretary of Energy
- Puget Sound Clean Air Agency
- Siemens
- State of California
- Transportation Energy Partners
- Trillium CNG
- UC-Berkeley

First Paper: Market Barriers & Role of Private Finance

- **Market barriers private finance can address**
  - Higher upfront cost
  - Some legal and regulatory hurdles
  - Consumer risk aversion to new technologies
  - Extended payback time for fueling infrastructure investments
- **Market barriers it *cannot* address**
  - When an AFV or fueling site is uneconomical
  - Consumer education
  - Regulatory restrictions (e.g., third party resale of natural gas and electricity)
  - Industry standardization

First Paper: Market Barriers & Role of Private Finance

- **Barriers specific private investors in AFV and fueling infrastructure deployment**
  - Legal, regulatory, and institutional barriers
  - Information-related barriers
  - Risk barriers
  - Scale barriers
- **These barriers are all make it more expensive to finance AFV projects: cost of capital**

Potential Solution from Commercial Building Sector

- **Energy savings performance contracts**
  - Used for building energy efficiency upgrades
  - Higher upfront cost of the technology, but lower operating cost
    – Finance bridges gap
  - Especially useful in the public sector
- **Possible AFV use: natural gas vehicles**

Potential Solution from Clean Energy Finance Banks

- **Solution for barriers to private finance**
- **Green banks**
  - Connecticut started green bank in 2011
  - NY has announced $1 billion green bank
  - Leverage public money to attract larger private investment
  - Credit Enhancements
    - What are they?
    - How do they help?
  - Creating markets for new financial instruments
- **Possible AFV use: new financial instruments like securitized products**

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FOR MORE INFORMATION

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